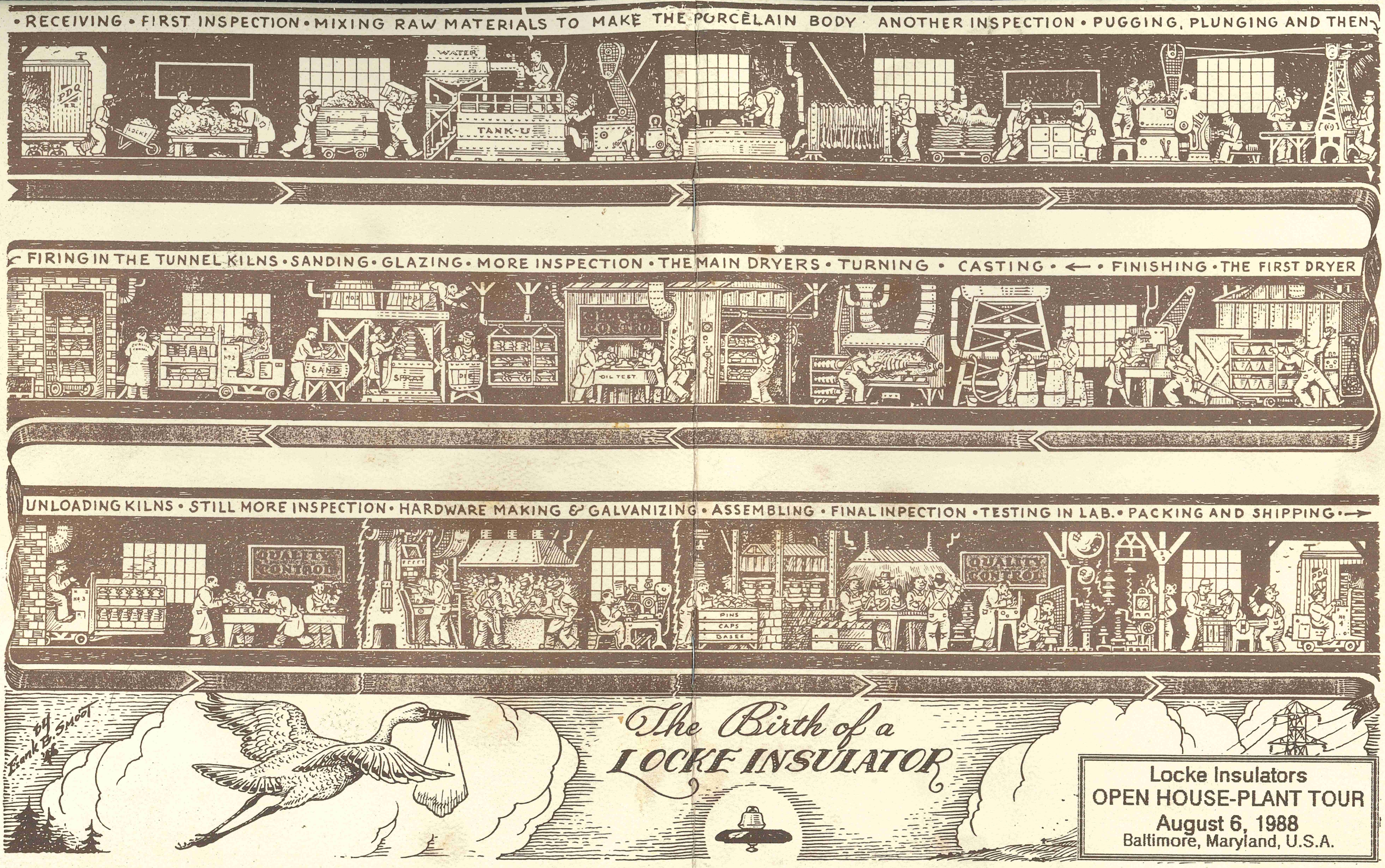
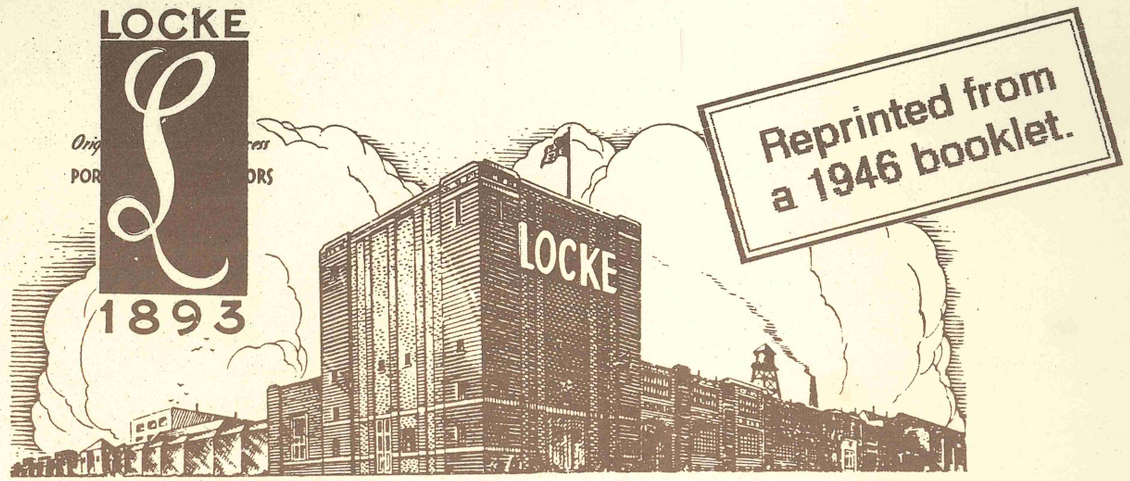

• RECEIVING • FIRST INSPECTION • MIXING RAW MATERIALS TO MAKE THE PORCELAIN BODY • ANOTHER INSPECTION • PUGGING, PLUNGING AND THEN
WATER
TANK-U
← • FIRING IN THE TUNNEL KILNS • SANDING • GLAZING • MORE INSPECTION • THE MAIN DRYERS • TURNING • CASTING • ← • FINISHING • THE FIRST DRYER
SAND
SPRAY
OIL TEST
UNLOADING KILNS • STILL MORE INSPECTION • HARDWARE MAKING & GALVANIZING • ASSEMBLING • FINAL INPECTION • TESTING IN LAB. • PACKING AND SHIPPING • →
QUALITY CONTROL
PINS
CAPS
BASES
The Birth of a
LOCKE INSULATOR
Drawn by Frank B. Smoot

Locke Insulators
OPEN HOUSE-PLANT TOUR
August 6, 1988
Baltimore, Maryland, U.S.A.



Let's Look at Locke...

You are a welcome visitor to the plant of the Locke Insulator Corporation--the world's largest manufacturer of wet-process porcelain insulators.

Our company was founded in 1893 in Victor, New York, by Fred M. Locke. Mr. Locke was a telegraph operator on the New York Central Railroad. He conceived and developed the first wet-process porcelain insulator because of the difficulties that he personally experienced with the insulators then in use on telegraph lines.

From a small beginning in 1893 has grown a whole industry that is fundamental in making possible the safe and economical transmission and distribution of electric power. With the advent of the high-voltage transmission line around the turn of the century came a big problem--insulators that would stand such high electrical stresses and yet were strong and reliable. Mr. Locke's insulators proved to be the answer. In fact, it is the only material manufactured today for such use.

Our company's only plant was in Victor until 1920 when the Baltimore plant was started. From 1920 until 1935 both plants were operated. In 1935, the plant at Victor was abandoned and all manufacturing was taken over by Baltimore.

[Continued on inside-back cover.]

Welcome to

THE LOCKE INSULATOR COMPANY

OPEN HOUSE & PLANT TOUR

"It is a great pleasure to welcome Locke retirees, employees, and family members to visit our facility. Here you will be able to see why my Locke co-workers and I are proud of the over 2,000 products manufactured here in Baltimore. These electrical insulators and other porcelain products are used throughout the North American continent and in many countries of the world.

"All of us are engaged in a difficult struggle to help Locke become the Success Story of Maryland. If, in each job, we apply dedicated determination, willing cooperation, and skilled experience, I feel certain that we will make it happen. Such confidence can be greatly strengthened by the support and understanding of the members of our respective families. Thank you for coming to visit with us."

--Gus Isobe, President

Locke Insulators, Baltimore, Maryland, USA

PROGRAM

Open House-Plant Tour
Saturday, August 6, 1988
Locke Insulators, Inc., Baltimore, Maryland, USA

10:00 a.m. to 12:00 noon

Self-Guided Tour of Plant: Please follow the bright orange arrows and numbers [same numbers are on pages 8 and 9 of this guidebook]; at end of tour is reception and refreshments area.

11:00 a.m. to 12:15 p.m.

Every 15 minutes there will be a showing of the video, "People and Porcelain of Locke Insulators," in the first-floor large conference room at the north end of main lobby, past nurse's office.

11:00 a.m. to 1:00 p.m.

Light Lunch:
Variety Sandwiches, Chips, Assorted Cookies, Soft Drinks

12:30 p.m.

Welcoming Remarks and Prize Drawings
[Reception and refreshments area at end of tour; if you attended the Open House-Plant Tour or you are working Saturday morning, you are eligible for the drawing. You do not have to be present at 12:30 to win.]

1:00 p.m. to 3:00 p.m.

Pick Up Softball Game at Swan Park; Softball Coordinator--Steve Henze. (Swan Park is near Locke, on the other side of Hanover Street near Interstate 95--from Locke, turn right on Hanover; at next traffic light, turn left to the playing fields.)

FOR YOUR INFORMATION: Do you know that...

...Locke Insulators provides, as the following paragraphs detail, a flow of millions of dollars into the economy of greater Baltimore and the State of Maryland, helping to create jobs for hundreds of other Marylanders.

...to run the kilns and other equipment, last year Locke spent nearly one million dollars ($968,840) for natural gas.

...the over 2,000 Locke products range from a list price of $3.00 to over $3,000 each.

...Locke's electrical bill for 1987 was over a half million dollars ($575,302).

...we used 75,954,164 gallons of water last year costing over $26,000.

...Locke's 1987 and projected 1988 tax bills from the City of Baltimore and State of Maryland will total over $344,000.

...Locke ships its products to all 50 of the United States, plus Puerto Rico, and, through the cooperation of NGK, to over 11 countries.

...the total 1987 and projected 1988 payroll for Locke employees will be about $23,745,000.

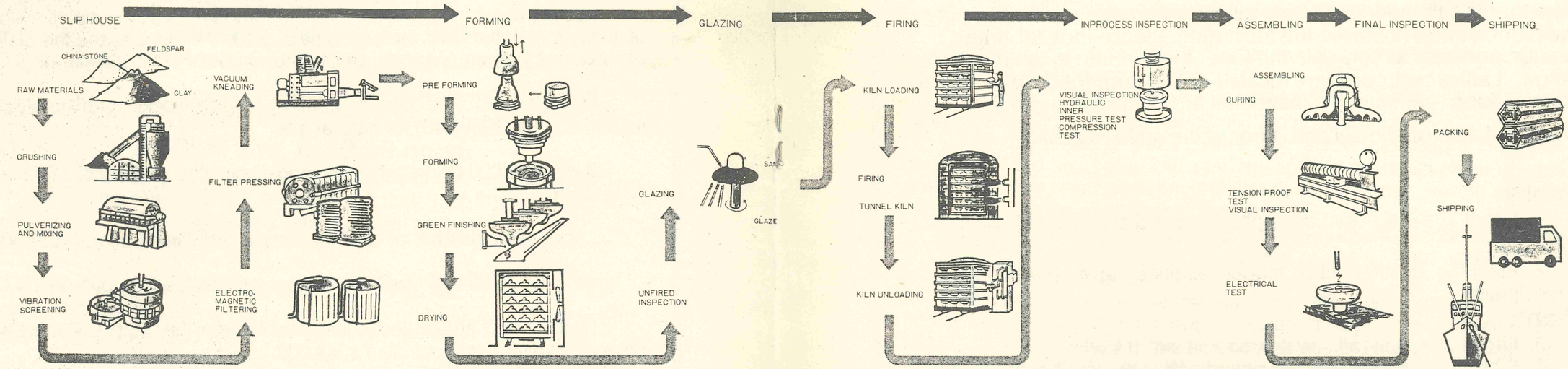
...the Locke facility is under nearly 20 acres of 123 separate major roofs; to re-roof the entire area would cost an estimated $5 to 6 million. In roof maintenance alone, Locke spends $300 to $350 thousand each year.

...the cost of health care, insurance, and other benefits for Locke employees and their families during last year and projected for this year will amount to over $8,243,000.

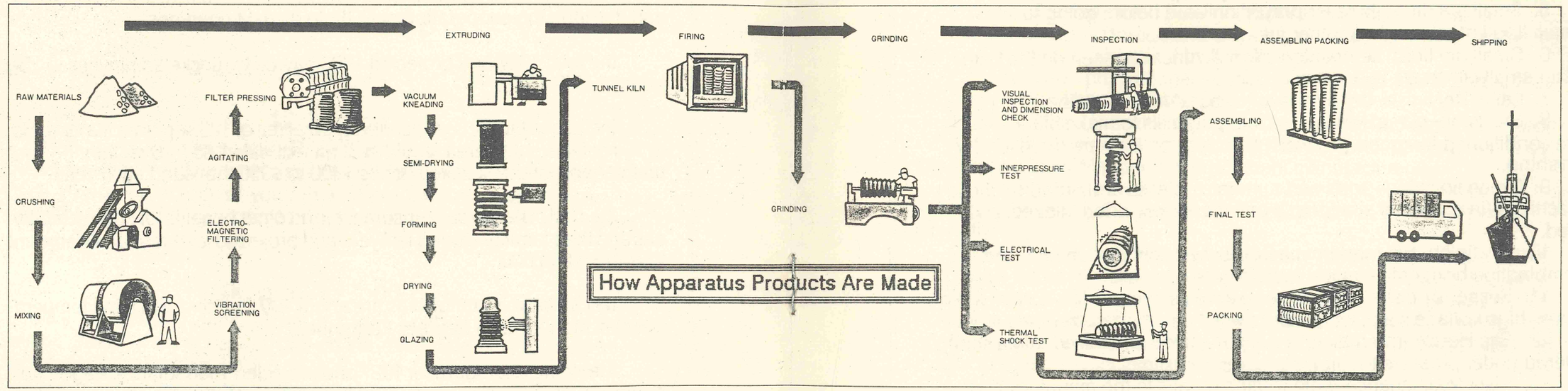
...two of Locke's tunnel kilns are about 400 feet long with firing temperatures as high as 2300 degrees Fahrenheit.

...the grand total figure for 1987 and projected 1988 salaries, wages, and benefits paid by Locke will amount to nearly $32,000,000.

How Suspension Insulators Are Made



How Apparatus Products Are Made



HIGHLIGHTS OF THE OPEN HOUSE-PLANT TOUR

(The tour is self-guided. Please follow the orange arrows through the plant and do not leave the tour route. Please look for bright orange numbers as you walk the tour; these relate to the numbers below. Ladies restrooms are located in first floor lobby and office second floor; gentlemen's restrooms are found throughout the plant and also on the second floor of the main office.]

Lobby:

1. List of 17 "Firsts" for Locke; photos of Locke's basic product lines.

Offices:

2. Planning, quality control, product engineering, manufacturing, development.

Plant:

3. Fired Inspection--all suspension and switch shells.
4. Kilns--three tunnel and two periodic kilns (three other periodic kilns are located in the south end of the plant).
5. Small glazing--glaze is sprayed on ware before going to kilns. Small flood glazing is in another area.
6. Small dry finish semi-automatic machines are seen on the tour; other small lathes are in another area.
7. Large dry finish--dry blanks are shaped into insulators.
8. Extrusion--clay cakes are fed into pug mills to make blanks which are conditioned for green (or "wet") finishing; or, they are dried for dry finishing.
9. Green finishing--posts and apparatus pieces are turned on these machines (in a manner similar to a potter's wheel), dried, glazed, and fired.
10. Dry finish--two modern machines: twin spindle complex and the combination horizontal-vertical four spindle complex.
11. Suspension shell line make--known as "Pearl," this complex produces high voltage suspension shells which are then glazed and fired.
12. Slip House--raw materials are pulverized and mixed into a slurry, filtered under pressure to form clay cakes, or "slips."
13. Plant Maintenance--from routine repairs to the manufacture of

machine parts, maintenance has a critical role to play in the plant.

14. Low voltage line make--4-1/4" and 6" shells for low voltage insulators.
15. Tunnel driers--recently extended to increase capacity, these driers carefully dry ware prior to glazing.
16. Large line make--24" line is used for 50K DC, 40K HLD, and large switch shells; highly skilled hand finishing is part of this.
17. Glaze--variety of glazing wheels dip shells into troughs filled with glaze and sand-band glue and sand are applied on the insulator heads to ensure a strong bond when the metal parts are cemented during assembly. From here the ware goes to the kilns.
18. Transportation maintenance--the plant cannot operate without fork lifts and transporters to move materials and products; hard usage requires constant maintenance and repair.
19. Inspect and grind--nearly completed, the fired apparatus is cut off and/or faced and chamfered; from here, about 80 percent of the porcelains is packed and sent to the customer; the other 20 percent moves on to assembly where hardware is attached prior to packing and shipping.
20. Post assembly--hardware is cemented to the porcelain; the pieces are then bend tested, given final inspection, packed, and shipped.
21. Warehouse--storage and shipping of all packing materials and finished insulators is handled by this small crew.
22. Hardware--product specification testing, mechanical preparation, sarco spraying of hardware components of insulators.
23. Gas Circuit Breaker--assembly of hardware and porcelains; product is inspected, given a water pressure test, cleaned, packed, and is usually shipped to OEMs (original equipment manufacturers).
24. High Voltage Test Laboratory--a variety of tests are made on Locke insulators, including thermal shock, electrical stress, and mechanical strength.
25. Line Assembly--off-line post assembly cements hardware to the porcelains after which they are steam-cured, cleaned, bend tested, and packed; main electrical test line checks each insulator for punctures; assembly of high voltage insulators prior to their placement on the conveyor on their way to the steam conditioner; they are then pull tested, cleaned, electrical tested, inspected, packed, and shipped.

From the Baltimore Sun, November, 1983

Insulator-making, Japan style

MATT
SEIDEN

America should take careful note of what's happening in the old Locke insulator plant at the foot of the Hanover street bridge here.

Founded in 1893, Locke was the world's first manufacturer of electrical insulators — ceramic plates used to separate power lines from non-energized metallic parts in electric power plants and substations.

In 1920, General Electric bought out Locke and built a major new plant on the Baltimore waterfront. Continuing to use the Locke name, G.E. was now the world's largest producer of electric insulators.

But a major challenge was already in the making, far away and unobserved, in Japan.

The challenge began around the turn of the century when a Japanese electrical engineer visited the United States and took home a sample of a Locke insulator.

The engineer showed the ceramic device to officials of Noritake, a Japanese manufacturer of fine porcelain tableware. Noritake agreed to try making a few copies of the American product.

The copies were so successful Noritake created a subsidiary called Nippon Gaishi Kaishya (Japan Insulator Company), or N.G.K., for short. N.G.K. is now the world's largest manufacturer of porcelain insulators, employing 5,000 people in Japan and many more around the world.

Meanwhile, Locke's fortunes gradually declined. By 1974 the Baltimore plant was losing money, and General Electric was threatening to shut it down for good.

Instead, G.E. sold N.G.K. a controlling 60 percent interest in Locke.

"Locke was our teacher, our ancestor. It was the company that taught us the business," an N.G.K. official said the other day. "So we had a strong feeling about the company, and the idea of rescuing it seemed to make sense."

But the rescue was not to be easily accomplished at a time when worldwide recession was causing a decline in the demand for energy and a corresponding drop in the demand for power plant components.

At first N.G.K. sent over a lone Japanese executive who maintained a relatively low profile here, overseeing what was still essentially an American-run factory. Locke continued to lose money.

Then, in 1981, N.G.K. decided on a bolder strategy: To increase productivity and decrease costs, it would try to rebuild Locke from top to bottom according to the Japanese model.

To remake Locke in its own image, N.G.K. sent a new team of aggressive, young Japanese managers, advisers and technicians. They were given three years to succeed. One year remains.

"It is a final bet," Mike Shibata, the new president of Locke Insulators, said the other day. "If we fail, we surrender, close up shop and go home."

Two years after Shibata's arrival, the company is still operating in the red and still fighting for its life in a highly competitive industry in a still-sluggish market.

But there are hopeful signs for Locke's 450 local employees and their foreign managers.

The Japanese have introduced new product lines, brought in some modern Japanese equipment, and aggressively sought and won new contracts.

But they say the biggest and most important challenge lies in increasing the productivity of the American work force.

How are they doing this?

"Our philosophy is the family concept," Shibata says. "The company is like a dad, and the employees are the kids. If the company is growing, then all the kids have a better time. If the company is in trouble, then all the kids pitch in.

"When we came here, the feeling among the workers was us against them, the workers against the company. We have tried to show them that we are all on the same side. We are not enemies."

The practical results of benevolent paternalism have been mixed.

On the one hand, the United Electrical Workers have managed to negotiate a new contract with no salary cuts or benefit concessions at a time when union workers elsewhere have not always been so lucky.

And the new philosophy has also led to a reduction in blue-collar layoffs. Layoffs were commonplace before the Japanese took over.

When they have had to cut jobs, the Japanese have trimmed sharply from the top instead, firing or giving early retirement incentives to nearly 70 white-collar employees.

The trade-off for the blue-collar workers has come in the work load.

According to management and union officials and a number of workers interviewed at the plant and elsewhere, almost everyone at Locke is now working harder and, most say, more efficiently.

On the factory floor, for example, workers who have slack time at their specialized tasks are given other jobs to do until they are needed back at their basic posts. Before they were allowed to sit around and wait.

Janitorial work has also been cut by asking workers to help keep their own work areas clean. This request has been dramatically underscored by the Japanese chairman of the board who makes daily rounds picking up cigarette butts from the factory floor.

"The Japanese are out on the floor all the time, so they really know what's going on," said Jim Johnson, president of the union local and a 19-year veteran at Locke. "The G.E. managers would walk through in a three-piece suit maybe once a week. These guys are out here picking up cigarette butts a couple of times a day. And their doors are always open upstairs. Communication is wide open."

I asked Johnson and others if there weren't some workers who are not happy about the extra work load or the foreign managers.

"There are always some problems," the union official said, "but most of us realize that if the Japanese hadn't taken over, we'd all be out of jobs by now. That's the bottom line."

Later, I asked Shibata how he would sum up the Japanese management formula.

"There's no secret formula," he said. "It's all common sense: motivation, loyalty, pride. We learned it all from you."

Locke Insulators, Baltimore, Maryland, USA

[1946 Booklet: continued from inside-front cover.]

Our Products.....

They are many and varied. Here's a partial list of them:

Insulators and Line Hardware for high-voltage transmission lines and substations

Distribution Insulators and Hardware for medium and low-voltage lines

High-voltage Bushings for electrical transformers and circuit-breakers

Porcelain Components for all types of electrical apparatus

Porcelain Grinding Balls and Bricks for grinding and mixing porcelain enamel frits, paint pigments and the like

Specialty Porcelain for a wide variety of mechanical, electrical and chemical applications

Our Size.....

More than 1200 employees occupy a total floor space of approximately 450,000 square feet in a total plant area of about 13 acres.

Our Firing Equipment.....

We have in operation three modern, oil-fired tunnel kilns that are equipped with completely automatic controls. In addition, there are two muffle kilns for firing large pieces of great value that are coal-fired. Also two periodic kilns of the old Beehive type are still used for firing exceptionally long pieces.

Two of the tunnel kilns are 365 feet long, and the third is 200 feet long. In the longer ones, an insulator requires about 100 hours to go all the way through. In the shorter one, it takes about 40 hours.

The maximum temperature in these kilns is approximately 2200 degrees F. Compare that with the 70 degree temperature in your home and you'll get some idea of what we may have to face in the next world! We burn 100,000 gallons of fuel oil per month in the kilns, and use another 125,000 gallons per month for heating and process steam.

The High-voltage Laboratory.....

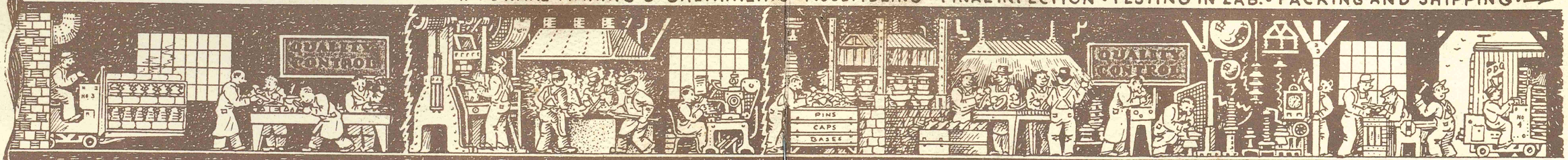
The transformers in our high-voltage laboratory are capable of putting out over 1,000,000 volts, single phase, 60 cycle. The impulse (or lightning) machine has a capacity of just over 2,000,000 volts. This is more than adequate for testing any insulator or group of insulators in use today.

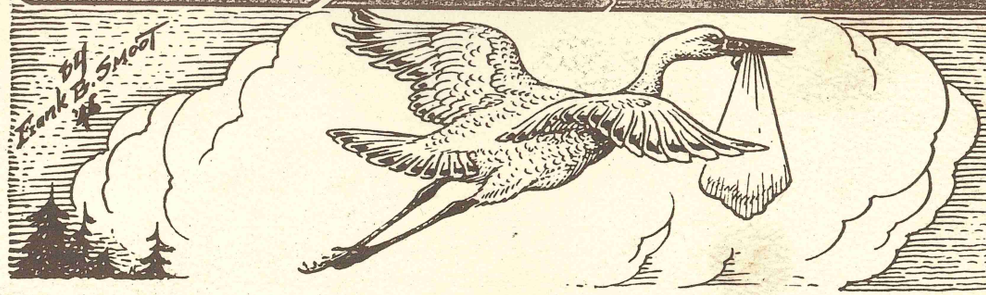
Locke INSULATOR CORPORATION
BALTIMORE, MARYLAND

• RECEIVING • FIRST INSPECTION • MIXING RAW MATERIALS TO MAKE THE PORCELAIN BODY ANOTHER INSPECTION • PUGGING, PLUNGING AND THEN

FIRING IN THE TUNNEL KILNS • SANDING • GLAZING • MORE INSPECTION • THE MAIN DRYERS • TURNING • CASTING • ← • FINISHING • THE FIRST DRYER

UNLOADING KILNS • STILL MORE INSPECTION • HARDWARE MAKING & GALVANIZING • ASSEMBLING • FINAL INPECTION • TESTING IN LAB. • PACKING AND SHIPPING • →





The Birth of a LOCKE INSULATOR

Locke Insulators
OPEN HOUSE-PLANT TOUR
August 6, 1988
Baltimore, Maryland, U.S.A.